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SPO-108

SPECIFICATION

MAMMALIAN GENES INVOLVED IN CIRCADIAN PERIODS

5 Technical Field

The present invention relates to mammalian genes whose expression changes with a circadian period.

10 Background Art

Many biochemical processes, physiological processes, and behavioral processes in various organisms ranging from microorganisms to vertebrates exhibit circadian rhythms (Edmunds, L. N. J., Cellular and Molecular Basis of Biological Clock, Springer-Verlag, New York, 1988). Several genes have been suggested to be involved in circadian rhythms.

For example, two mammalian circadian clock mutations have been confirmed thus far. They are Clock of the mouse (Vitaterna, M. H., et al., Science 264: 719-725, 1994) and tau of the hamster (Ralph, M. R. and Menaker, M., Science 241: 1225-1227, 1988). The Clock gene has recently been identified and is believed to encode a transcription factor in the circadian clock (Moor, R. Y. and Eichler, V. B., Brain Res. 42: 201-206: 1972; Stephan, F. K. and Zucker, I., Proc. Natl. Acad. Sci. USA 69: 1583-1586, 1972). On the other hand, the tau gene has not yet been cloned.

25 The period (per) gene has been isolated from *Drosophila* as a gene necessary for the expression of circadian rhythms for locomotive activities and eclosion behavior (Konopka, R. J. and Benzer, S., Proc. Natl. Acad. Sci. USA 68: 2112-2116, 1971). In the brain of the fly the oscillation of the levels of the per mRNA and of the PERIOD (dPER) protein are thought to determine the rhythms (Hardin, P. E., et al., Nature 343: 536-540, 1990; Zerr, D. M., et al., J. Neurosci. 10: 2749-2762, 1990). However, per homologues in other organisms than insects have not been identified.

35 Disclosure of the Invention

An object of the present invention is to provide novel